

United States Is the Greatest Radium Producing Country in the Entire World

Deposits in Colorado, Long Neglected, Are Being Worked; New Process Used to Extract the Valuable Ore.

WASHINGTON, D. C., NOV. 28.—Uncle Sam is going into the business of mining for radium. Fifty-seven claims already taken up will be worked in the Paradox valley of Colorado, under the direction of government experts. The bureau of mines has established a mill to handle and concentrate the raw material, and experimental work will be done in a laboratory at Denver, with a view to finding out new methods whereby this most precious of all substances may be most economically separated from the materials with which in nature it is found combined.

Starting from Placerville, and following the San Miguel river made a distance of 12 miles, the traveler finds himself at the entrance of this wonderful valley, which is a canyon, its precipitous walls rising 1200 to 1500 feet. No more picturesque region could be imagined, for the walls are of brilliant colors, stained by a strata of red sandstone, white sandstone and other strikingly contrasted mineral formations. The precipitous are so steep that prospectors hunting for radium are obliged to climb along like flies, making trails as they go.

Look for Yellowish Green Stains. What they look for is yellowish-green stains on the exposed surfaces of the rocks, which are made by oxides of uranium and vanadium, which are always associated with radium. The prospector, his attention drawn by such an indication, blasts a tunnel into the cliff, in the hope of discovering a "pocket" of ore. The latter being a mineral known as "carnotite," which contains uranium and vanadium, together with more or less radium. There are many such "pockets," but discovery of them is hopeless except in cases of accidental exposure.

Now it is popularly supposed that ore of radium are mostly found in Europe, and that the precious element is extracted chiefly from "pitchblende," a hard, black mineral mined in Bohemia, where the Jochimsenthal, the radium producing deposits are controlled by the Austrian government. But the fact is that the principal source of the supply for a number of years past has been carnotite—lump, yellow ore which, occurring in pockets in sandstone, has never been found in considerable quantities anywhere, outside of Colorado. This is the stuff for which the prospectors hunt in the Paradox valley, which is by far the richest radium bearing district in the world.

The foreign manufacturers of radium during past years have quietly bought up all the carnotite they could get hold of and have shipped it abroad, where the radium has been extracted from it by laboratory methods more or less secret. In this way Colorado has been furnishing annually three times as much radium as all the rest of the world put together.

The rocky stratum which contains the pockets of the radium-bearing ore is far down beneath the surface of the earth. But in the canyons, where rivers have cut through the mountains, a knife cuts through a cake, this stratum is exposed to view and rendered accessible. In Montrose and San Miguel counties (Colo.), and to the west in Utah, deposits of carnotite are found, and before radium had been thought of, they were mined for uranium.

Total Supply Less Than Two Pounds. The total quantity of radium in the state of Colorado has been estimated at a little less than two pounds. It is believed by the bureau of mines, however, that this is an over estimate. The substance has never been separated out in a pure state, but a gram of radium chloride today has a market value of \$97,000—at which rate, a single ounce would be worth somewhat over \$2,500,000. Supposing, then, that in Colorado there is a total of only one procurable pound of radium, it ought to sell for \$40,000,000 at the current price.

In all likelihood radium will never be cheaper than it is at present. The carnotite is much more easily treated for its extraction than pitchblende, and in future we shall hold our ores for higher prices than foreign buyers have been paying for theirs hitherto, while producing on our own supplies of the precious substance at home. There is no question that the production of radium will increase. The available supply being so limited, with no large resources in sight outside of Colorado, the industry is worth promoting.

Buy Up the Claims. The above mentioned 57 claims in the Paradox valley have been acquired, not by the government, but by a number of wealthy men in New York, Boston and elsewhere, who, purely for philanthropic reasons, are anxious to procure radium in quantity. When they have got it they propose to place it in the hands of the medical profession, especially for dealing with cancer, and with this idea in view, the requisite clinical arrangements have already been made at the Johns Hopkins hospital, in Baltimore.

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A little Danderine immediately doubles the beauty of your hair. No difference how dull, faded, brittle and scraggy, just moisten your hair with Danderine and carefully draw it through your hair, taking one small strand at a time. The effect is surprising—your hair will be light, fluffy and wavy, and have an appearance of abundance, an incomparable lustre, softness and luxuriance.

Get a 25 cent bottle of Knowlton's Danderine from any drug store or toilet counter, and you will find that it is as pretty and soft as any hair that has been neglected—or injured by careless treatment—there's all you need to have beautiful hair and lots of it if you will just try a little Danderine.—Advertisement.

more, and at the Memorial hospital, in New York city. At the head of the enterprise is Howard A. Kelly, of Baltimore.

Yields Small Particles. Inasmuch as a ton of carnotite will yield a lump of radium hardly larger than a pin head, chemical methods of extracting the substance. Experience has shown that the best way to test the carnotite is to place it on a piece of paper, in the dark, a photographic plate in two thicknesses of black paper, then to lay upon the paper a key, and just above the latter to suspend a piece of ore weighing two or three ounces, the whole being thereupon placed in a light tight box. After three or four days the plate is developed and if the ore contains any radium an image of the key will be found on the plate.

There seems to be no question of the fact that radium affords an effective means of dealing with certain forms of cancer, especially when the latter is internal. While producing little change in healthy tissue, it attacks and destroys the cancerous growths. For instance, on April 1, of the present year, a cancer was removed from the liver of a man nearly 70 years of age at the Methodist hospital in Philadelphia. His case had been deemed hopeless, but since then he has been getting well quite rapidly.

For such purposes "exposures" of 24 to 120 hours are made, the radium rays being filtered (for a reason presently to be mentioned) through a thin sheet of lead. But whereas the concentrated action of the rays from some human cancerous growths, smaller quantities (as shown by many experiments) may have no beneficial effect. It is obvious, then, that radium should be available in considerable quantity for medical use, yet it is doubtful if at the present time there is in the hands of the medical profession in this country more than a single gram of this rare element.

If radium possessed no practical usefulness, it would nevertheless be of enormous interest to science. It comes nearer to being a miracle than any substance else we know of in nature. A substance that actually contains a force (such a phenomenon having hitherto been deemed an impossibility), a single gram of it, if its power were properly applied, might drive an automobile around the world. Indeed, it might continue to drive the automobile forever, apparently, inasmuch as the force it gives out does not seem to undergo any perceptible diminution with time. Here we have a suggestion of another impossibility in physics, namely, perpetual motion.

Gives Three Kinds of Rays. Radium gives out three kinds of rays—"alpha" rays, "beta" rays, and "gamma" rays. The alpha rays may be shut off by paper or glass. Both the alpha and beta rays may be shut off by a sheet of lead only one-five-hundredth of an inch thick. But the gamma rays will pass through iron or other metal with scarce any interruption, the extent of their penetrating power depending upon the quantity of radium used. It is the gamma rays that filter out in the manner described, that are used in treating cancer.

Finely powdered willemites when

mixed with radium become brilliantly luminous. It has been suggested that a solution of this mixture, if injected into the veins of human beings, would as it was carried along by the blood, illuminate the tissues of the body, enabling an observer in a dark room to see the beating of the heart, the circulation of the vital fluid through the arteries, and even the most intimate circumstances of the lungs and liver. Lighting up the stomach and intestines, it would show the digestive organs at work. In fact, by such means important diagnosis might be made. But the difficulty lies in the cost of the substance. Nobody but a millionaire could afford to pay for radium employed in such a way, inasmuch as it would be lost.

Burns Stomach With Radium. It was Prof. Becquerel, of Paris, who first suggested the use of radium for curative purposes. Being engaged in experiments with the substance, he carried in his waistcoat a tube containing a very small quantity of it. As a result, his stomach was severely burned. This led him to the idea that radium might be employed for attacking cancer. So great is the power stored in radium that its discoverer, Mme. Curie, declared that a single gram of the substance, chemically pure, would destroy the life of every human being in Paris, if separately exposed to its influence.

The Germans report much success with radium in the treatment of rheumatism. Sufferers from that complaint inhale minute quantities of radium emanations, and drink water which has been charged with the emanations of mineral springs are found to contain radium, and it is believed that the curative properties of many of these, such as the famous waters of Bath, may be attributable to the presence in them of gas given off by this marvelous substance.

Mother's Friend in Every Home

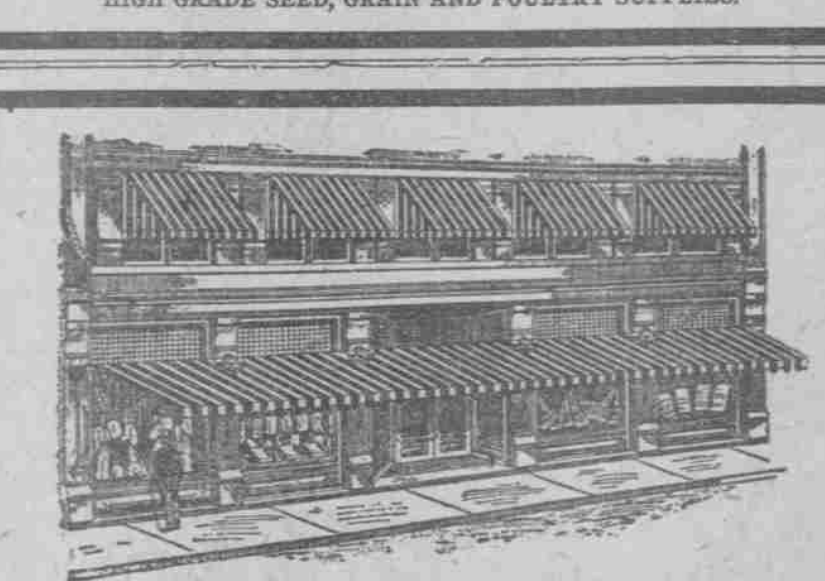
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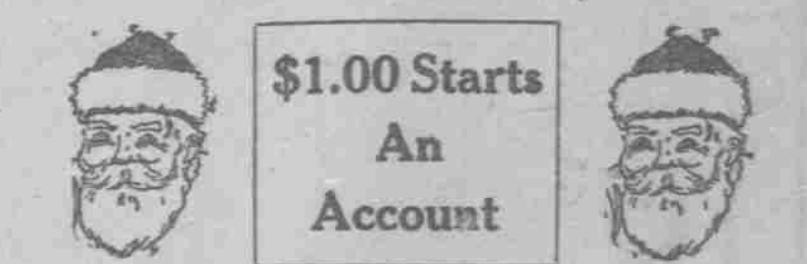
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The El Paso Herald was established in March, 1881. The El Paso Herald includes also, by absorption and succession, The Daily News, The Telegraph, The Telegram, The Tribune, The Graphic, The Sun, The Advertiser, The Independent, The Journal, The Republic, The Bulletin.

MEMBER ASSOCIATED PRESS AND AMER. NEWSP. PUBLISHERS' ASSOC.
Entered at the Postoffice in El Paso, Tex., as Second Class Matter. The Daily Herald is issued six days a week at El Paso, Texas.

TERMS OF SUBSCRIPTION.
Daily Herald, per month, 60c; per year, \$7.00. Wednesday and Week-End issues will be mailed for \$2.00 per year.
The Daily Herald is delivered by carriers in El Paso, East El Paso, Fort Bliss and Tornes, Texas, and Ciudad Juarez, Mexico, at 6c a month. In ordering a change of address please give the old as well as the new address.

HERALD TELEPHONES

Circulation Department 2024
Business Office 135
Editorial Rooms 2020
Society Reporter 2020
Advertising Department 114

TELEPHONE COMPLAINTS EARLY.

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FOREIGN BUSINESS OFFICES.

The John Budd Co., Brunswick Building, New York; Tribune Building, Chicago, Ill. and Chemical Building, St. Louis, Mo.

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